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April 1, 2003

Date

Judith Muzyk
Judith Muzyk

Docket No.: **582/9-1477**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: **Albert BAUER**

Serial No.: **08/998,507**

Group Art Unit: **3743**

Filed: **December 26, 1997**

Examiner: **John Ford**

For: **AIR CONDITIONING APPARATUS**

Commissioner for Patents
Washington, DC 20231

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APPEAL BRIEF

Sir:

This is an Appeal from the Final Rejection dated July 2, 2002 in the above-identified application, of claims 44-46 and 51-59. The appealed claims appear in Appendix A.

Real Party in Interest

The real party in interest is the inventor, Mr. Albert Bauer.

Related Proceedings

There are no related appeals or interferences which will directly affect or be directly affected by or have a bearing on the board's decision in this appeal.

Status of Claims

Claims 1-32 were originally in this application, which were subject to a restriction requirement. Claims 1-4, 7 and 9-32 were elected for examination. Claims 33-43 were added during prosecution. Subsequently claims 1-4, 7, and 9-43 were cancelled in favor of claims 44-63. In a subsequent species election, claims 44-46, 51-59, 60 and 62 were elected for continued prosecution. Claims 60 and 62 were objected to as being dependent upon a rejected base claim but were considered allowable and are not subject to this appeal. Claims 44-46 and 51-59 have been finally rejected.

Status of Amendments

No amendments were made subsequent to the Final Rejection.

Summary of the Invention

The applicant's invention relates to an air conditioning apparatus which economically ensures more comfortable room conditions and an optimal mixing of room air with supply air to achieve rapid adaption to the desired heating/cooling values (P. 2, L. 8-12).

Underlying the invention is the discovery that the greater the excess pressure is in a room provided by the supply air blown through the room, the faster the room warms up, so that efficiency is improved and large temperature fluctuations are avoided. (P. 2, L. 26 - P. 3, L. 3).

In one embodiment of the invention, the temperature of the supply air and the channel pressure of the supply air are coupled in dependence on the value of the room temperature and the desired room temperature so that the channel pressure of the supply air is raised or lowered in

the room, rooms or room zones. (P. 5, L. 5-10). Heated air with the higher channel pressure is blown into the room only if the temperature of the supply air lies above the predetermined desired temperature of the room. (P. 5, L. 26-28).

The integration of pressure regulation with temperature control is illustrated in Fig. 5. The desired temperature is compared to the actual room temperature to generate a regulating temperature. The temperature difference ΔT_n , along with the supply air temperature T_{zu} and of the supply air pressure P_{zu} are used by the regulator 320 to generate a setting signal which is fed to the throttle control valves 60, 61 in Fig. 1. The throttle control values are regulated in dependance on the desired room temperature value, on the actual room temperature, on the temperature of the supply air as well as in dependance on the supply air pressure. (P. 22, l. 14-28).

Figure 10 illustrates the integration of pressure control with temperature control. "From a predetermined temperature threshold value of the supply air...with further rising air supply temperature, the air supply pressure also is increased, since the regulation of the air supply pressure occurs in dependance on the temperature of the air supply." (P. 27, l. 10-25).

Page 6, lines 13-18 describes a heating case in which the desired value of the room temperature is less than the actual value of the room temperature. In that case, the channel pressure of the supply air is lowered with rising room temperature. Correspondingly, for the cooling case, in which the desired value of the room temperature is greater than the actual value of the room temperature, the channel pressure of the supply air is lowered with falling room temperature.

The controlled variation of room pressure is illustrated in Fig. 6a, which shows the

pressure profile when the actual room temperature is less than the desired room temperature, and Fig. 6b which shows the pressure profile when the actual room temperature is greater than the desired room temperature. (P. 14, l. 20-26).

The pressure regulating means vary the room pressure as a controlled variable so that comfort and efficiency are improved, as overswings in temperature are avoided as well as undesirable air movements. (P. 8, l. 16-19).

Issues

- 1) Whether claims 44 and 51-59 are anticipated under 35 U.S.C. §102(b) by U.S. Patent No. 4,237,318 ("Johanssen").
- 2) Whether claims 44 and 51-59 are obvious under 35 U.S.C. §103(a) over Johanssen in view of U.S. Patent No. 5,971,067 ("Rayburn").
- 3) Whether claim 45 is obvious under 35 U.S.C. §103(a) over Johanssen in view of Rayburn, and further in view of U.S. Patent No. 4,347,712 ("Benton").
- 4) Whether claim 46 is obvious under 35 U.S.C. §103(a) over Johanssen in view of Rayburn and further in view of U.S. Patent No. 4,189,094 ("Robinson").

Grouping of Claims

There are three groupings of claims; I) claims 44 and 51-59; II) claims 45 and III) claim 46. The claim(s) in each group stand or fall together.

Argument

I. Claim 44 is not anticipate by Johanssen

Claims 44 and 51 through 59 were rejected under 35 U.S.C. §102(b) as being anticipated by Johanssen, U.S. Patent No. 4,257,318, with reference to Col. 2, l. 3-15, Fig. 5, Col. 4, l. 36-47, and Col. 12, l.39, and 59-61.

The Federal Circuit has consistently held that anticipation can only be established by a single prior art reference which discloses each and every element of the claimed invention. In re Bond, 910 F.2d 831 (Fed. Cir. 1990); Atlas Powder Co. v. E.I. DuPont de Nemours & Co. 750 F.2d 1569 (Fed. Cir. 1984). The Federal Circuit has also stated that “even if the claimed invention is disclosed in a printed publication, that disclosure will not suffice as prior art if it is not enabling.” In re Donohue, 766 F.2d 531, 533 (Fed. Cir. 1985) (citing In re Borst, 345 F.2d 851, 855 (C.C.P.A. 1965), cert. denied, 382 U.S. 973 (1966), Seymour v. Osburn 78 U.S. (11 Wall.) 516, 555 (1870) (publication constitutes anticipation only if it enables one skilled in the art to “to understand the nature and operation of the invention, and to carry it into practical use.”).

The examiner referred to Fig. 5 and the description beginning at column 12, line 39 as disclosing “regulating the exhaust blower to be a fixed CFM below the supply air CFM. This clearly varies the room pressure relative to the outside so that a slight positive pressure will be maintained in the building...” (Final Rejection, page 2 emphasis added). However, the inventive system does not “maintain” a slight positive pressure in a room, but to the contrary, varies the room pressure in correspondence to the selected room temperature.

For the anticipation analysis, the applicant would draw attention to the regulating means

of claim 44 which read as follows “means for regulating an increase in pressure in the at least one room relative to an outside pressure, to vary the room pressure in correspondence to the selected room temperature.” (emphasis added)

The pressure regulating means is a key feature of the invention. Rather than having a system which substantially maintains the room pressure regardless of the selected room temperature, the inventive system integrates room pressure as a controlled variable in the temperature control by varying the room pressure in relation to the selected room temperature.

As stated on page 6, lines 13-18 “in the first place, for the heating case in which the desired value of the room temperature is less than the actual value of the room temperature, the channel pressure of the supply air is lowered with rising room temperature. Correspondingly, for the cooling case, in which the desired value of the room temperature is greater than the actual value of the room temperature, the channel pressure of the supply air is lowered with falling room temperature.” The effects on room pressure are illustrated in Fig. 6a, where the actual room temperature is less than the desired room temperature, and Fig. 6b, where the pressure profile when the actual room temperature is greater than the desired room temperature. (Spec. p. 14, l. 20-26) None of the art cited by the examiner discloses such a pressure regulation system which varies room pressure in correspondence to the selected room temperature.

The examiner’s reliance on Fig. 5 of Johannsen is misplaced as : “Fig. 5 illustrates the required relationship between air flow of the discharge blower and the return blower in a typical distribution system... curve 160 represents the required relationship between the two blowers for the hypothetical building under discussion. Broken line 161...represents equal values of the supply and return blowers. Curve 160 is offset below curve 161 by a constant value of 5000

CFM, so that at a supply blower rate of 40,000 CFM, the return blower requirement is 35,000 CFM and so on down to a 0 return blower requirement for a 5000 CFM supply air flow. The 5000 CFM difference represents the relatively constant exhaust from the building through bathroom vents and the like previously discussed. In actual practice the actual blower is operated at slightly less than the values indicated in Fig. 5 so that a slight positive pressure will be maintained in the building....” Col. 12, lines 38-60. (Emphasis added)

This description confirms that regardless of variations in the volume of air supply, the difference between supply and return is constant, and no pressure regulation is accomplished according to Johannsen and certainly no pressure regulation means are provided to vary room pressure in correspondence to the selected room temperature. Even the slight positive pressure is described relative to exfiltration, not selected room temperature.

The reference to Col. 4, lines 36-47 is also contrary to the applicant’s invention, as it states specifically that “these temperature control groups are not part of the pressure control system of the present invention.” (Emphasis added) In fact , the invention is stated as an improved pressure control system for an air distribution system which “provides a variable dead band control for greater efficiency in maintaining a desired pressure. Col. 3, lines 15-17 (Emphasis Added).

When considering the document as a whole, there is no disclosure of the pressure regulation means as described in claim 44, and certainly, Johannsen lacks an enabling disclosure as there is nothing which would enable one skilled in the art referring to Johannsen to effect pressure regulation to vary the room pressure in correspondence to the selected room temperature. Consequently, claims 44 and 51-59 are not anticipated by Johanssen.

II. The Prior Art Does Not Teach or Suggest the Invention of Claim 44

Claims 44 and 51-59 were rejected under 35 U.S.C. §103(a) as being unpatentable over the prior art (Johanssen) as applied to claims 44 and 51-59 discussed above and further in view of Rayburn, et al U.S. Patent No. 5,971,067.

In order to uphold a finding of obviousness, there must be some teaching, suggestion or incentive for doing what the applicant has done. ACS Hospital Systems, Inc. v. Montefiori Hospital, 723 F.2d 1572 (Fed. Cir.1984). It is not within the framework of 35 U.S.C. §103(a) to pick and choose from the prior art only so much as will support a holding of obviousness to the exclusion of other parts necessary for a full appreciation of what the prior art teaches or suggests, as hindsight is not the test. In re Wesslau, 353 F.2d 238 (C.C.P.A. 1965). Also, “both the suggestion and the expectation of the of success must be found in the prior art, not in the applicant’s disclosure”. In re Dow Chemical Co., 837 F.2d 469 (Fed. Cir. 1988).

As discussed above, Johanssen discloses a system which maintains room pressure regardless of the variations in volumetric flow through the room. In fact, the dead band controller is specifically used to dampen variation so as to more closely maintain the constant pressure sought in the room. Fig. 4 is illustrative as it shows a command set point voltage 146 demonstrating how closely the pressure value of curve of 143 tracks with the command set point voltage 146. The description in Col. 10, lines 40-67 describe how when a vent is opened, the system adapts by making adjustments so as to maintain the pressure regardless of the opening of the vents.

This is completely contrary to the applicant’s invention which has means for regulating an increase in pressure in a room and to vary the room pressure in correspondence to the selected

room temperature. In Johannsen, the pressure control circuit is totally independent of the temperature control loops, as stated on Page 4, lines 45-46. Therefore, there is no teaching, suggestion or incentive in Johannsen for providing the system of the applicant's invention as described in claim 44.

The examiner refers to Rayburn Fig. 2 and Col. 7, lines 1-12 as describing how conventional zone air controllers operate. However, even with that disclosure, there is no disclosure in Rayburn of the particular relationship called for in claim 44 of the applicant's invention, utilizing pressure regulating means for varying the room pressure in correspondence to the selected room temperature. In fact, the combination of the teachings would lead one to use the dead band controller of Johannsen with Rayburn, to more closely maintain the room pressure, regardless of the variation in air flow volume. Thus, one is lead away from, not towards, the applicant's inventions.

Consequently, the combination of references does not teach, suggest or even hint at the applicant's invention and in fact these references teach the contrary, as one skilled in the art referring to these two patents would be led to conclude that it is important to maintain room pressure in the face of variable volume flow rates and in fact to have controls for assuring that the room pressure is maintained. Clearly, claim 44 is not rendered obvious in view of this combination.

III. The Prior Art Does Not Teach or Suggest the Invention of Claim 45

Claim 45 was rejected under 35 U.S.C. §103(a) as being unpatentable over the prior art described above as applied to claim 44 and further in view of Benton, et al U.S. Patent No.

4,347,712. The examiner referred to Benton by stating “to vary supply air temperature of Johannsen in the manner taught by Benton to save energy would have been obvious to one of ordinary skill”.

While claim 45 relates to the control arrangement for controlling the cooling/heating means to adjust the temperature of the supply air, there still remains no teaching, suggestion or incentive in the combination for providing means for regulating an increase in pressure in the at least one room relative to an outside pressure, to vary the room pressure in correspondence to the selected room temperature. As in the prior art discussed above, Benton at Col. 2, lines 34-39 describes that there is a differential pressure controller 21 “to maintain a predetermined air pressure in the supply or discharge duct 25.”. Again, maintenance in the face of variable flow volumes is indicated. Note that this is the only mention in the patent of any pressure control, and there is no mention or even an inference of any room pressure control relative to the selected room temperature. Consequently, Benton similarly continues to direct one skilled in the art away from the applicant’s invention as there is no teaching, suggestion or inference for utilizing a means for regulating pressure in at least one room to vary the pressure in correspondence to the selected room temperature and consequently claim 45 is not obvious in view of the combination suggested by the examiner.

IV. The Prior Art Does Not Teach or Suggest the Invention of Claim 46

Claim 46 was rejected under 35 U.S.C. §103(a) as being unpatentable over any of the above described prior art as applied to claim 44 and further in view of Robinson, U.S. Patent No. 4,189,094. Claims 46 further adds that the regulating means regulate the room pressure relative

to an outside air temperature.

In the first instance, none of the documents cited by the examiner teach or suggest regulating the room temperature in correspondence to the selected room temperature as described above and the deficiency is not overcome by the combination with Robinson. Robinson described the use of particular mechanisms for controlling the speed of the supply and exhaust motors "with a view to maintaining the fan outputs equal to each other and so avoiding any difference in pressure between the pool itself on the one hand and the changing areas, halls, cafeterias, etc. on the other hand..." In other words, Rayburn also describes a system having controls which maintain room pressure but do not have means for regulating an increase in room pressure to vary the room pressure in correspondence to the selected room temperature. Absent a teaching, suggestion or incentive for doing as the applicant has done, claim 46 is not rendered obvious by the combination.

As discussed above, the applicant's invention is directed to a system which is distinct from the air conditioning systems of the prior art where room pressure is independently controlled, without relation to the temperature control loop, and is only provided to assure that constant pressure is maintained regardless of the volume of air flow. Rather, the invention goes in the opposite direction in that room pressure is a controlled variable, changing in correspondence to the selected room temperature, which surprisingly has a significant impact on air mixing and temperature uniformity, while enabling the use of up to 100% fresh air make-up. Drafts and cold/hot spots are avoided increasing comfort, and the elimination of high recirculation rates found in the prior art systems generates significant energy savings of up to 50%. The materials supplied to the examiner, including a videotape demonstration of the

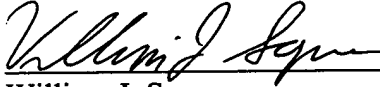
inventive system in operation include testimonials to the dramatic improvement achieved with the invention. Clearly, there is no teaching, suggestion or incentive in any of the references cited for such a system and the results achieved are quite surprising and dramatic both in the improvement in temperature control in a room and in the significantly reduced energy costs.

IV. Conclusion

Based on the above remarks, claims 44-46 and 51-59 are novel and unobvious and reversal of each rejection is respectfully requested.

Respectfully submitted,

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Appendix A.

44. An air-conditioning apparatus for controlling a temperature condition in at least one room to achieve a selected room temperature condition for ventilation using temperature adjusted supply air comprising:

a supply air motor for supplying air at a supply air pressure through a supply air channel to the at least one room;

cooling-heating means for adjusting a temperature of the supply air;

means for regulating an increase in pressure in the at least one room relative to an outside pressure, to vary the room pressure in correspondence to the selected room temperature.

45. The air-conditioning apparatus of claim 44 further comprising a control arrangement for controlling the cooling-heating means to adjust the temperature of the supply air.

46. The air-conditioning apparatus of claim 44 wherein the regulating means further regulates the room pressure relative to an outside air temperature.

51. The air-conditioning apparatus of claim 44 wherein the regulating means regulates the room pressure by adjusting the supply air motor to alter the supply air pressure.

52. The air-conditioning apparatus of claim 44 further comprising a control valve disposed in the supply air channel and wherein the regulating means regulates the room pressure by adjusting the control valve.

53. The air-conditioning apparatus of claim 44 wherein the regulating means regulates room pressure by setting the supply air motor to supply a set increased supply air pressure.

54. The air-conditioning apparatus of claim 44 further comprising an exhaust air motor to withdraw air from the at least one room through an exhaust air channel.

55. The air-conditioning apparatus of claim 54 further comprising means for regulating exhaust air motor to adjust an amount of exhaust air withdrawn from the at least one room.

56. The air-conditioning apparatus of claim 54 wherein the regulating means regulates the room pressure by setting the supply air motor to supply a set increased supply air pressure and by setting the exhaust air motor to withdraw a set amount of exhaust air from the at least one room.

57. The air-conditioning apparatus of claim 54 wherein the regulating means regulates the room pressure by adjusting the exhaust air motor, to adjust an amount of air withdrawn from the room through the exhaust air channel.

58. The air-conditioning apparatus of claim 55 wherein the regulating means adjusts the room pressure by adjusting the exhaust air regulating means to control the amount of exhaust air withdrawn from the room.

59. The air-conditioning apparatus of claim 54 wherein the room pressure is a measured difference between a value of the supply air pressure and a value of an exhaust air pressure.